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DEMONSTRATORS and the DIFFUSION of FERTILIZER PRACTICES

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CONTENTS

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DEMONSTRATORS and the DIFFUSION of FERTILIZER PRACTICES[1]

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SUMMARY

The purpose of this study is to determine the process by which a fertilizer practice diffuses from farmer demonstrators to the surrounding farmer audiences. Data were gathered from 47 farmers in Miami County, Ohio, who completed corn and hay fertilizer demonstration plots during the 1959 crop year. The main practice demonstrated was the value of higher applications of fertilizer in terms of higher yields or profits. Research interviews were completed with a random sample of 86 commercial farmers in Miami County before the demonstration began; they are termed the **audience** in the present publication. Seventy-seven of the original audience sample were reinterviewed after the demonstration program was completed.

Major findings from the present study may be summarized as follows:

1. Twenty-eight percent of the audience first learned about the demonstration program by seeing a road sign, 22 percent by talking with a demonstrator, and 19 percent by reading about the program in a newspaper. Sixteen percent actually visited a demonstration.

2. Demonstrators differed from the audience in their personal characteristics. Demonstrators were characterized by more opinion leadership, earlier adoption of farm innovations, more favorable attitudes toward fertilizer, more knowledge about fertilizer, more years of formal education, higher formal participation, less belief in agricultural magic, and higher social status.

3. The more effective demonstrators (who talked to more audience farmers) were slightly higher in opinion leadership than the less effective, but did not differ significantly on other characteristics studied.

[1]Ohio Agricultural Experiment Station Project State Special 88, entitled: The Impact of Demonstrations on Farmers' Attitudes Toward Fertilizer.

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4. Demonstrators function as opinion leaders in the two-step flow of communication by which ideas flow from the mass media to local opinion leaders and then to the mass audience. Demonstrators use more cosmopolite information sources than the audience. Cosmopolite sources are those external to the community, such as bulletins, farm magazines, soil tests, and contact with county agents. The present findings suggest a modification of the two-step flow from any relevant cosmopolite source to opinion leaders and from them by localite means to the mass audience.

5. The portion of the audience that personally communicated with demonstrators is characterized by more opinion leadership, greater knowledge of fertilizer, higher social status, more years of education, more favorable attitudes toward fertilizer, earlier adoption of farm innovations, and more formal participation. Farmers reached by demonstrations have similar characteristics to those reached by most other educational methods which depend on voluntary participation.

6. Members of the audience tended to communicate personally with demonstrators in the same or earlier adopting categories, with a similar or higher social status, and with those who lived within an average of four miles. This is an example of the tendency for individuals to associate with others of similar attitudes and values, although the present findings on this point should be regarded as tentative because of the limited nature of the data.

INTRODUCTION

Average corn yield per acre in Ohio in 1959 was about 59 bushels. Agronomists estimate that if Ohio farmers utilized all recommended corn-growing practices, average corn yield per acre should be about 85 bushels. Gross cash value of this additional corn production was approximately 26 dollars per acre in 1959. One practice that explains a large part of the gap between actual and potential yields is level of fertilizer application. While most farmers in Ohio have been utilizing fertilizer as a means of attaining higher crop yields for many years, there is evidence that most farmers do not use adequate fertilizer for economic efficiency. In fact, it has been estimated that farmers now using fertilizer could use three times the present amount economically.[3]

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[3]George M. Beal and Joe M. Bohlen, "The Potential of the Fertilizer Dealer," Paper presented at the National Plant Food Institute, February, 1960, Chicago, Illinois.

Extension workers, teachers, and fertilizer salespeople expend considerable effort to encourage farmers to use higher fertilizer applications. One educational method that has been widely utilized is the farm demonstration. A farm demonstration is a controlled, on-the-farm trial comparing two farm methods. The demonstration is conducted by the farmer, often with the help of a change agent. A change agent is a professional person who attempts to secure changes in the behavior of his clientele.[4]

Demonstrations have long been recognized as a teaching method to encourage the adoption of farm innovations. Seaman Knapp in 1904 used the demonstration method in Texas to teach control of the cotton boll weevil. The Tennessee Valley Authority (TVA) has made extensive use of test-demonstration farms. One research study found that the influence of TVA demonstration farms was largely confined to a circle with a five mile radius.[5] The demonstrators were found to have different social and economic characteristics than non-demonstrators.

Extension Service personnel presently make widespread use of the demonstration method. This is especially true in the case of Extension teaching of agronomic practices. Commercial demonstrations are also important; Beal and Bohlen[6] found 15 percent of the fertilizer dealers in Iowa sponsored test plots and demonstrations. Relatively little is actually known, however, about the effectiveness of demonstrations in securing adoption of innovations and in changing farmer attitudes.

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[4]It should be pointed out that while the usual role of the change agent is to promote the adoption of innovations, in some cases he may act to retard or to prevent adoption of a nonrecommended innovation.

[5]John Blackmore, R. M. Dimit, and E. L. Baum, Test-Demonstration Farms and the Spread of Improved Farm Practices in Southwest Virginia, Knoxville, Tennessee Valley Authority Bulletin P-55-3, 1955; and Robert M. Dimit, Diffusion and Adoption of Approved Farm Phactices in 11 Counties in Southwest Virginia, Ames, Iowa State University, Unpublished Ph.D. Thesis, 1954. A closely related study of TVA demonstrators is Eugene A. Wilkening and Frank A. Santopolo, The Diffusion of Improved Farm Practices from Unit-Demonstration Farms in the Tennessee Valley Counties of North Carolina, Raleigh, North Carolina Agricultural Experiment Station Mimeo Bulletin, 1952. An excellent review of literature on demonstration research studies is Andrew W. Baird and Wilfred C. Bailey, Test-Demonstration and Related Areas: Review of Literature, State College, Mississippi, Preliminary Reports in Sociology and Rural Life 11, 1960.

[6]Beal and Bohlen, op. cit.

PURPOSE

The present study is an attempt to determine the nature of the process by which a fertilizer practice is communicated from farmer demonstrators to the surrounding farmer audience. More specific objectives may be listed as follows:

1. To determine how farmers learn about a large-scale fertilizer demonstration program.
2. To determine how demonstrators differ from their audience.
3. To determine which demonstrators are the most effective communicators.
4. To determine the extent that the demonstrator is an opinion leader in the two-step flow of communication.
5. To determine those in the audience reached by demonstrators.
6. To determine the extent that demonstrators communicate with members of the audience who are similar to them in personal and social characteristics.

The present findings should be of use to such varied audiences as Extension workers, teachers, fertilizer salespeople, farmers and social scientists. On the basis of the present study it should be possible to suggest improved techniques for conducting farmer demonstrations. The eventual goal of this type of research is to "speed up" the process by which innovations may be communicated to and adopted by farmers.

THE DEMONSTRATION PROGRAM

The present findings may best be understood in terms of the fertilizer demonstration program that was analyzed. For this reason, a detailed description of the demonstration program is presented so that the reader may judge whether the present findings apply to his own situation.

During the 1959 crop year, 47 farmers in Miami County, Ohio, completed 57 corn and hay fertilizer demonstration plots. The demonstration program was conducted jointly by the County Extension Agent, Extension Agronomy Specialists, and fertilizer salespeople. The latter assisted the demonstrators in laying out plots, planting, and checking harvest results. None of the demonstrators received free fertilizer or fertilizer at a reduced price; they did receive a free soil sample and a road sign. Farmers were nominated by the Miami County Agronomy Committee who chose farmers they believed would cooperate in a demonstration program. The county agent sent a letter to the 110

farmers nominated and the first 52 farmers to respond were included in the demonstration program.

Of the original 52 farmers who agreed to conduct fertilizer demonstration plots, 47 farmers completed 57 plots of corn and hay. One hay plot was harvested before a yield sample was taken. Four corn plots were not completed; one was harvested for silage before it was yield-checked and a second was harvested by a hired man unacquainted with the location of the demonstration plot. Two other corn plots were dropped early in the crop year when one farmer moved to another farm and another demonstrator died. Location of the 47 demonstrators who completed their fertilizer demonstrations is shown in Figure 1 (presented in a later section of this publication).

THE DEMONSTRATIONS

The corn fertilizer demonstration plots were at least eight rows in width across the field. Fertilizer was applied at three levels.

1. The farmers' normal rate of fertilization.
2. The amount recommended by soil test.
3. Soil test recommendation plus 50 pounds of nitrogen per acre.

Some farmers applied a fourth level of fertilization at even higher rates for their own information.

A kernel spacing of seven inches and a planting speed not to exceed five miles per hour were also specified. Some farmers also used their normal rate of kernel spacing along with their normal rate of fertilization to compare results between the two levels of plant population.

The hay fertilizer demonstration plots were at least four drill or spreader widths across the field. The crop preferred was alfalfa or an alfalfa-grass mixture. Fertilizer was applied at two levels:

1. The farmers' normal rate of fertilizer.
2. According to soil test recommendations.

Hay yields were determined a few days before each harvest. The corn yields were determined at maturity but before the farmers harvested their corn.

CONDUCTING the DEMONSTRATIONS

Road signs were placed on each farmer's demonstration plot (along a well-travelled road when possible) in June, 1959. The signs were 28 by 44 inches in size with lettering in green on a bright yellow background.

In addition to road signs, an attempt was made to publicize the demonstration program by other methods. Newspaper articles and photographs were carried in local newspapers throughout the crop

year. A May tour of hay and corn demonstrations was held on three farms. During August, a special tour of two corn demonstrations was held for fertilizer industry personnel. Corn yield tours were held in October for other demonstrators, fertilizer salespeople, and the general public. A banquet for the demonstration farmers was held in late November at which the results from the demonstration plots were presented.

Harvesting of the demonstration plots was supervised by fertilizer salespeople who worked with each demonstration farmer. The yield plots were laid out by the project staff.[7]

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[7]For further details on the demonstration program and how it was conducted, see Everett M. Rogers and others, The Impact of Demonstrations on Farmers' Attitudes Toward Fertilizer: A Progress Report, Wooster, Ohio Agricultural Experiment Station Mimeo Bulletin A.E. 308, 1959; and Frank O. Leuthold, Demonstrators and the Diffusion of Fertilizer Practices, Unpublished M. S. Thesis, Columbus, Ohio State University, 1960.

Photo 1.—An Agronomy Extension Specialist, County Extension Agent, and a Demonstrator Are Shown with the Road Sign Marking the Demonstrator's Fertilizer Plot.

YIELD RESULTS

The results from the demonstration plots were influenced by insufficient rainfall.[8] The lack of rainfall during July and August, 1959, contributed to low hay yields for the second and third cuttings. The average yields for the ten hay plots were: (1) 7,260 pounds per acre for the soil test recommendation plots; and (2) 6,025 pounds per acre for the check plots with usual fertilization rates. The difference of 1,235 pounds per acre occurred during the first cutting, with dry weather late in the crop season restricting differences for the second and third cuttings. The majority of the hay demonstrations were alfalfa. When hay is figured at $25.00 per ton, an additional $14.00 worth of hay was produced per acre due to the higher levels of fertilization. The average additional cost of fertilizer was approximately $7.00 per acre which means the hay fertilized at soil test recommendations yielded a return of $7.00 per acre over hay fertilized at usual fertilization rates.

The corn yields for the three levels of fertilization used by all the demonstrators produced the following yields per acre: (1) the farmers' normal rate of fertilization yielded 88 bushels per acre; (2) the soil test rate fertilization produced 91 bushels per acre; and (3) the "soil test plus" rate of fertilization yielded 97 bushels per acre. There were greater differences in corn yields between various soil types than between the different levels of fertilization. This is probably due to the lack of rainfall during the 1959 crop year.

METHODOLOGY

Data were secured from three separate field studies.[9]

1. A random area sample of Miami County farmers were interviewed in December, 1958, before the demonstration program was conducted. All farmers residing in sample areas (Figure 1) who operated 20 acres or more and could be contacted with no more than three calls were interviewed. This sample of 86 farmers is designated as the **original audience sample** in the remainder of this publication.

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[8]The rainfall for the county from April 1 to October 1, 1959, was 14 inches which is eight to nine inches less than normal. The hay plots showed a more normal response to fertilizer than the corn plots.

[9]A more detailed description of the methodology for the present study is contained in a companion publication, Everett M. Rogers and A. Eugene Havens, The Impact of Demonstrations on Farmers' Attitudes Toward Fertilizer, Wooster, Ohio Agricultural Experiment Station Research Bulletin 896, 1961.

2. The 47 demonstrators who completed their demonstration plots were interviewed in December, 1959, just after their corn demonstration plots were harvested.[10] They constitute the **demonstrator sample** (Figure 1).

3. Seventy-seven of the original audience sample were reinterviewed in March and April of 1960 after the demonstration program was completed. They are designated the **restudy audience sample.**

[10]It might be mentioned that two members of the demonstrator sample were also included in the audience sample. This could occur because the two samples were independently selected.

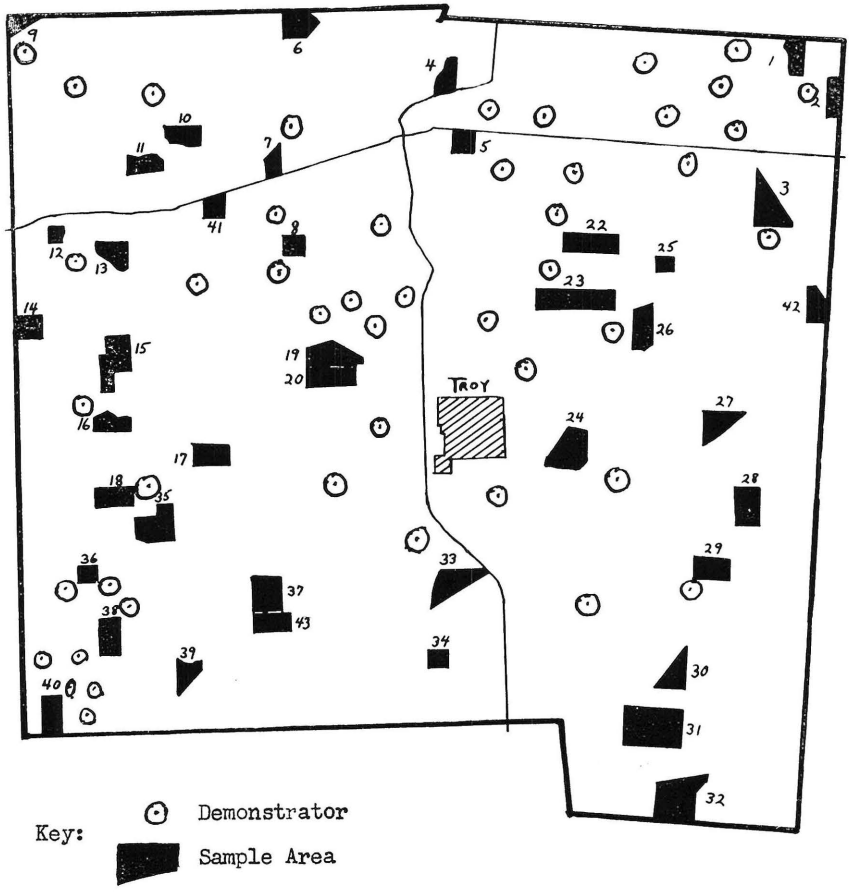

Fig. 1.—Sample areas and demonstrators in Miami County.

Nine members of the original audience sample were not reinterviewed for the following reasons: (1) four moved out of Miami County and were no longer farmers, (2) four refused to be reinterviewed, and (3) one could not be contacted after five visits.

AWARENESS of DEMONSTRATION PROGRAM

Figure 2 shows how the audience first learned of the existence of the demonstration program.[11] Seeing a road sign and talking with a

[11]Figure 2 only shows how 55 (70 percent) of the 77 members of the restudy audience first learned of the demonstration program. Thirty percent of the restudy audience was not aware of the demonstration program.

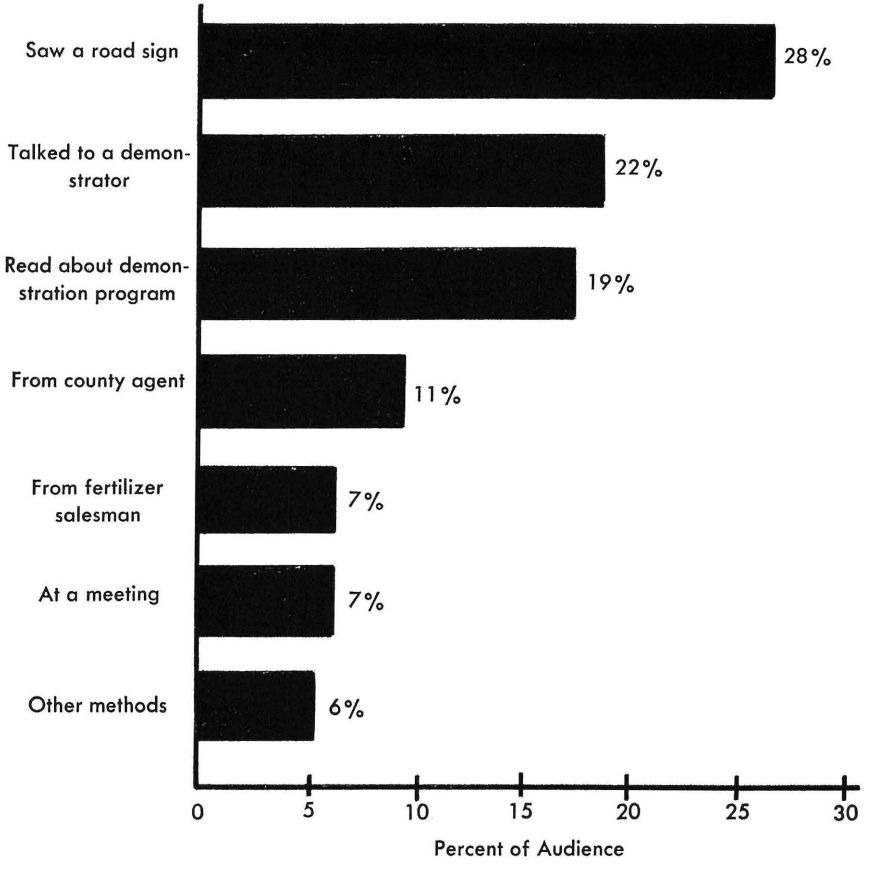

Fig. 2.—How audience first learned of existence of demonstration program.

demonstrator were the two most frequently mentioned methods of learning about the demonstration program. Seventy percent of the restudy audience sample was aware of the demonstration program, but many lacked details.[12]

Figure 3 shows the various sources of communication by which the audience gained further information about the demonstration program. Fifty-five percent of the restudy audience sample saw a road sign and 53 percent knew a demonstrator. Direct personal contact between the audience and the demonstrator was important; 25 percent of the restudy audience sample personnally talked with a demonstrator, and 16 percent visited a demonstration plot.[13]

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[12]Few of the audience knew the number of demonstrators in the program of the area (Miami County) included in the demonstration program.

[13]None of the audience attended an Extension-conducted demonstration tour; the 16 percent who visited demonstration plots did so on their own.

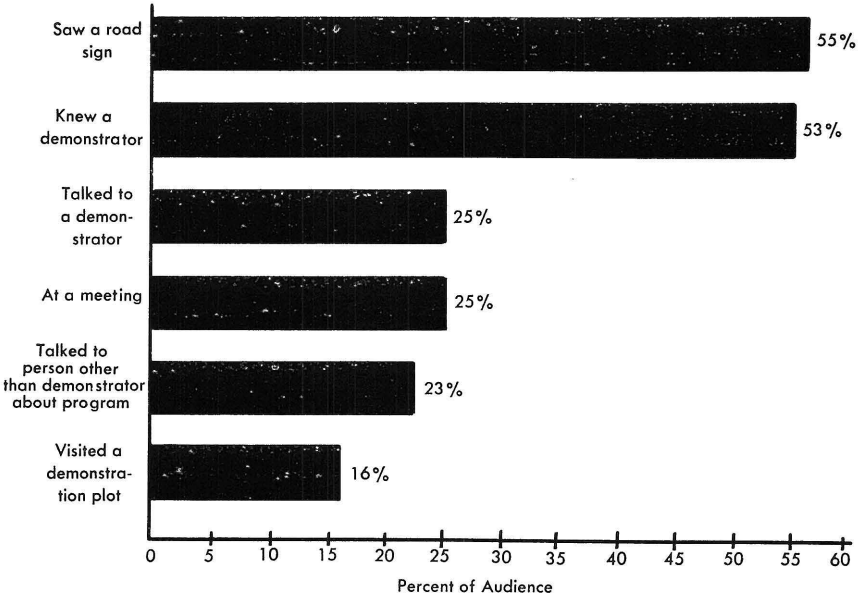

Fig. 3.—Various sources of communication by which audience gained further information about program.

DEMONSTRATOR-AUDIENCE DIFFERENCES

One possible reason for the relatively small amount of communication between the demonstrators and the audience might be that the demonstrators differed from the audience. It is reasonable to assume that individuals from the audience would be more likely to communicate with demonstrators similar to them in personal and social characteristics.

Do demonstrators differ from their audience? Table 1 indicates that demonstrators are generally more progressive.[14] When compared to the audience, demonstrators are characterized by:

More opinion leadership
Earlier adoption of farm innovations
More favorable attitudes toward fertilizer
More knowledge of fertilizer
Higher formal participation
More years of education
Less belief in agricultural magic
Higher social status.

No significant differences were found between demonstrators and the audience on age or percent of farm ownership.[15]

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[14]Some of the operational measures used are described as follows:

(1) Attitude toward fertilizer was measured with eight projective questions. Three judges independently scored each response on a three point scale from favorable to unfavorable. A typical scale item was, "I'd use more fertilizer but . . . . . ." More detail on the fertilizer attitude scale may be found in Rogers and Havens, op. cit.

(2) Fertilizer knowledge was measured with a scale containing six questions about fertilizer. Typical questions were the correct order of N, P, and K in a fertilizer formula, the best buy of two commercial fertilizers, and substitution for a common fertilizer formula.

(3) Opinion leadership was measured by three questions: (I) During the past six months have you told anyone about some new farming practice? (II) Compared with your circle of friends, are you more or less likely to be asked for advice about new farming practices? (III) Do you have the feeling that you are generally regarded by your neighbors as a pretty good source of advice about new farm practices? The opinion leadership scale had been utilized in several previous research studies.

(4) Adoption-of-farm-practices was measured by a fourteen item scale. The year each practice was adopted was converted to sten scores and averaged. The method of adopter categorization that was utilized is described in Everett M. Rogers, "Categorizing the Adopters of Agricultural Practices," Rural Sociology, 23:345-354, 1958.

[15]Demonstrators were younger and more often farm owners, but the differences were not significant.

Table 1.—Comparison of Characteristics of Demonstrators and the Original Audience Sample

Characteristic	Audience (N=86)	Demonstrators (N=47)	F Ratio	Level of Significance
1. Average opinion leadership score	2.7	4.6	37.5	1%
2. Percent in each adopter category				
Innovators	3%	28%	50.5	1%
Early Adopters	14%	37%		
Early Majority	38%	31%		
Late Majority	31%	2%		
Laggards	14%	2%		
3. Average fertilizer knowledge score	3.0	4.4	46.2	1%
4. Average fertilizer attitude score	15.6	16.6	5.72	5%
5. Average formal participation score	2.7	7.1	100.5	1%
6. Average years of education	9.8	11.4	11.42	1%
7. Average agricultural magic score	3.9	4.4	10.59	1%
8. Percent that ranked high or highest in social status	38%	70%	8.98	1%
9. Average age	49	46	1.62	n.s.*
10. Percent farm owners	57%	64%	3.22	n.s.*

*Not significant at the five percent level.

DEMONSTRATORS and EXTENT of COMMUNICATION WITH AUDIENCE

An attempt was made to determine which demonstrators were the most effective communicators. The measure of communication effeciveness is the number of farmers to whom each demonstrator stated he talked about his demonstration. This is a self-designated measure; in other words, it was reported by the demonstrators themselves.

Only opinion leadership was significantly related to the extent of demonstrator communication effectiveness (and because of the similarity in measures of opinion leadership and demonstrator communication effectiveness, the correlation of +.30 between the two variables is somewhat spurious). Demonstrators' membership in formal organizations,

social status, fertilizer attitudes, and knowledge of fertilizer were not significantly related to their communication effectiveness. In general, there were no important differences between those demonstrators who talked to many farmers in the audience and those demonstrators who talked to few.

DEMONSTRATORS and the TWO-STEP FLOW of COMMUNICATION

It has already been found that demonstrators are characterized by a higher degree of opinion leadership than the audience. This finding suggests that the farmer-demonstrator functions as an opinion leader in the two-step flow of communication, a theory initially proposed by Lazarsfeld and others[16] and since found to occur in a number of information-transmitting situations.[17] The two-step flow theory states that information flows from the mass media to local opinion leaders and then to the mass audience (Figure 4).

If the two-step flow of communication is operative in the present study, fertilizer information sources should be different for demonstrators than for the audience. Demonstrators should utilize both more cosmopolite and more impersonal sources than the audience on the basis of the paradigm in Figure 4.

Cosmopolite information sources are those external to the community such as bulletins, farm magazines, soil tests, and contact with the county agent. **Localite** sources are those internal to the community such as vo-ag teachers, fertilizer salesmen and dealers, neighbors, friends, relatives, and the farmer's own experience.[18] Table 2 shows that demonstrators utilize more cosmopolite information sources than does

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[16]Paul F. Lazarsfeld and others, The People's Choice, N. Y., Columbia University Press, 1948; and Elihu Katz, "The Two-Step Flow of Communication: An Up-To-Date Report on an Hypothesis," Public Opinion Quarterly 21:61-78, 1957.

[17]For example, Everett M. Rogers and Harold R. Capener, The County Extension Agent and His Constituents, Wooster, Ohio Agricultural Experiment Station Research Bulletin 858, 1960; and Everett M. Rogers and M. Dwayne Yost, Communication Behavior of County Extension Agents, Wooster, Ohio Agricultural Experiment Station Research Bulletin 850, 1960.

[18]A generally similar distinction between cosmopolite and localite sources of fertilizer information has been made by Herbert L. Campbell, Factors Related to Differential Use of Information Sources, Unpublished M. S. Thesis, Ames, Iowa State University, 1959.

the audience.[19] Thus, the two-step flow hypothesis is supported in that demonstrators use more cosmopolite sources.

[19]Chi square is 24.3 which is greater than the 6.6 required for significance at the one percent level with one degree of freedom.

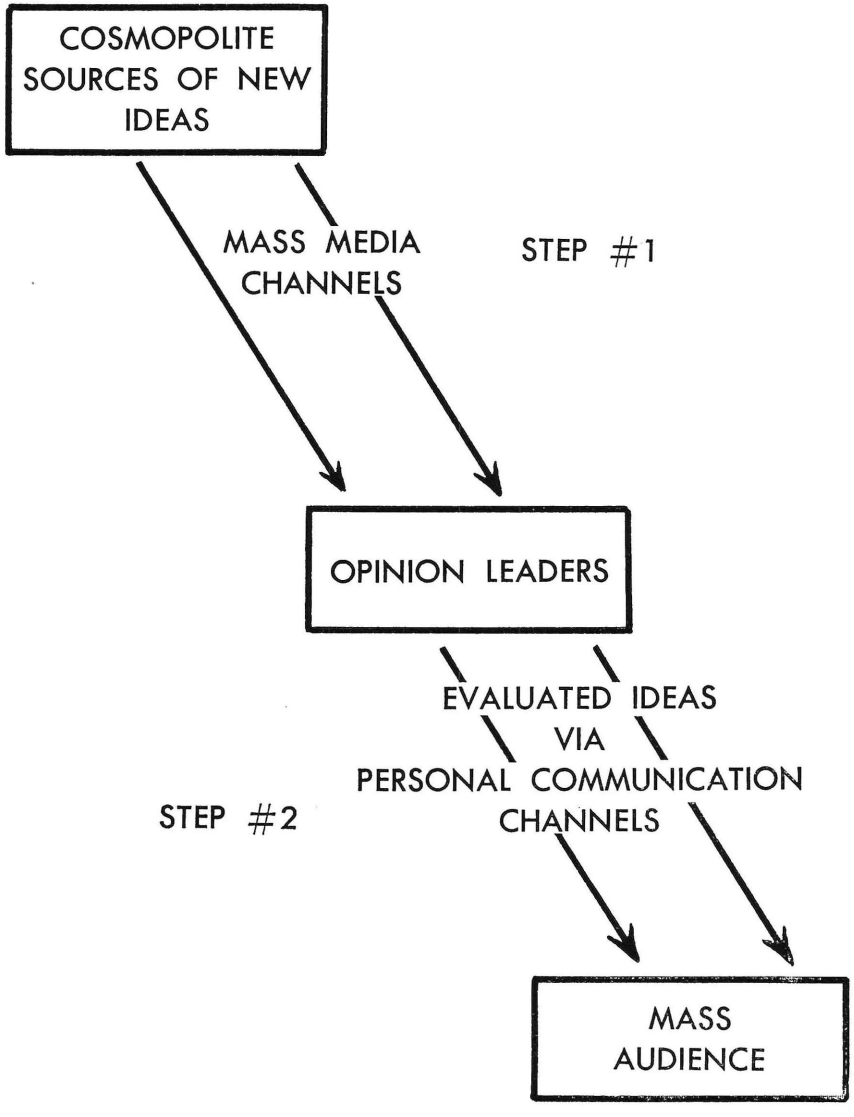

Fig. 4.—Two-step flow theory showing flow of communication from source to opinion leaders to mass audience.

The paradigm in Figure 4 also suggests that demonstrators would use more impersonal (mass media) sources while the audience would be more likely to utilize personal sources. **Personal** sources are those in which face-to-face communication occurs between the communicator and his audience.[20] Impersonal sources of information include farm magazines, bulletins, and soil tests; all other sources were categorized as personal. Demonstrators were slightly more likely than the audience to utilize impersonal sources of information but the difference was not significant.[21] The demonstrators used 42 percent impersonal sources and 56 percent personal sources of fertilizer information; the audience

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[20]Both the definition of personal sources of information and the categorization of personal and impersonal sources is similar to Everett M. Rogers and George M. Beal, "The Importance of Personal Influence in the Adoption of Technological Changes," Social Forces, 36:329-335, 1958.

[21]Chi square is 1.2 which is less than the 6.6 required for significance at the five percent level with one degree of freedom. It should be pointed out that there is a great degree of empirical overlap between the cosmopolite-localite categorization and the personal-impersonal categorization of information sources, but there is plainly a conceptual distinction.

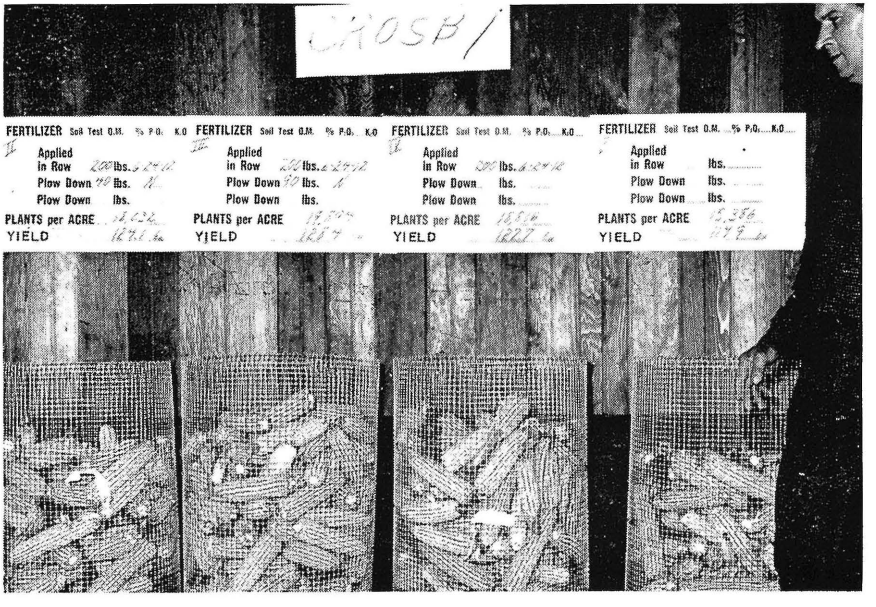

Photo 2.—This Demonstrator Studies His Corn Yield Results from His Fertilizer Plot.

utilized 35 percent impersonal and 62 percent personal sources of fertilizer information.[22]

The present findings generally indicate that demonstrators function as opinion leaders in the two-step flow of communication. They utilize more cosomopolite (but not necessarily more impersonal) information sources than does the audience. Perhaps these findings suggest a needed alteration in the two-step flow hypothesis: that ideas flow from any relevant cosomopolite source to opinion leaders and from them by localite means to the mass audience.[23]

The data in Table 2 show neighbors, friends, and relatives to be less important in the case of fertilizer information than they have generally been found in studies of the adoption of other farm innovations. Salesmen and dealers were found to be of greater importance for fertilizer than for most other innovations that have been studied. For example, only eight percent of the audience named neighbors, family,

[22]The audience named three percent "other sources" and the demonstrators named two percent "other sources" which could not be categorized.

[23]A similar change in the original two-step flow hypothesis has been suggested by Katz, op. cit.

Table 2.—Most Important Fertilizer Information Source for Demonstrators and Audience

Most Important Fertilizer Information Sources	Audience (N=77)	Demonstrators (N=47)
Cosmopolite Sources	(43%)	(78%)
Extension or Experiment Station bulletins	7%	21%
Farm magazines	23%	21%
Soil tests	5%	0%
County agent	8%	36%
Localite Sources	(54%)	(20%)
Vo-Ag teachers	6%	7%
Fertilizer dealers and salesmen	32%	13%
Neighbors	5%	0%
Family or relatives	3%	0%
Own experience	8%	0%
Other Sources	(3%)	(2%)
Total	100%	100%

or relatives as their most important fertilizer information source; 32 percent mentioned fertilizer salesmen or dealers.

Two reasons may be suggested as possible explanations for the greater importance of salesmen than neighbors in the case of fertilizer information. Many respondents in the present study stated in the research interviews that they did not regard neighbors as knowing any more about fertilizer than they did, while fertilizer dealers and salesmen should be more expert on this topic. A second possible explanation is that many of the fertilizer dealers mentioned were farmer-dealers who combine the social roles of "fertilizer seller" and "neighbor".

WHO IS REACHED BY DEMONSTRATIONS?

The demonstrators tended to reach the more progressive farmers in the present study. As shown in Table 3, members of the audience

Table 3.—Audience Characteristics of Those Farmers Reached and Not Reached by Demonstrators

Characteristic	Audience Reached by Demonstrators (N=22)	Audience Not Reached by Demonstrators (N=55)	Correlation of Audience Characteristic with Number of Contacts with Demonstrator	Level of Significance
1. Average opinion leadership score	3.4	2.2	+.33	1%
2. Average fertilizer knowledge score	4.0	2.9	+.32	1%
3. Percent that ranked high or highest in social status	45%	18%	+.30	1%
4. Average years of education	10.9	9.4	+.27	5%
5. Average fertilizer attitude score	17.3	15.0	+.24	5%
6. Percent in each adopter category				
Innovators	9%	0%	+.32	1%
Early Adopters	14%	15%		
Early Majority	50%	38%		
Late Majority	23%	33%		
Laggards	4%	14%		
7. Average formal participation score	3.4	2.4	+.23	5%

that communicated personally with demonstrators were characterized by:

More opinion leadership
More knowledge of fertilizer
Higher social status
More years of education
More favorable attitudes toward fertilizer
Earlier adoption of farm innovations
More formal participation

Farmers reached by demonstrations are probably somewhat similar to those reached by most other Extension methods. Farmers that may need the help least are reached most by demonstrations.[24] For example, those farmers who communicated with demonstrators were already using a 60 percent higher application of fertilizer per acre of corn during the crop year previous to the demonstration program.[25]

DEMONSTRATOR-AUDIENCE RELATIONSHIPS

The present findings indicated that demonstrators tended to be more progressive farmers, and the audience reached by demonstrators were more progressive farmers than those not reached. The next step in the present analysis is to determine the characteristics of each farmer and the demonstrator with which he communicated . Twenty-one members of the audience reported they communicated directly with 27 demonstrators.[26] Communication with demonstrators is defined as either visiting a demonstration plot or talking with a demonstrator about his demonstration plot. In the present analysis, each of the 43 demon-

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[24]There is a vast psychological literature that indicates persons tend to seek out and respond to communication messages that agree with their already existing attitudes and behavior. For example, see: Eunice Cooper and Marie Jahoda, "The Evasion of Propaganda: How Prejudiced People Respond to Anti-Prejudice Propaganda," Journal of Psychology, 23: 15-25, 1947; and D. Ehrlick and others, "Post-Decision Exposure to Relevant Information," Journal of Abnormal and Social Psychology, 54:98-102, 1957. In the present study, this tendency would explain why those with already high levels of fertilizer knowledge sought demonstrators to learn more about fertilizer.

[25]Fertilizer usage was measured by asking the respondents the amount of fertilizer used on corn per acre. The responses were converted to actual pounds of nitrogen, phosphorus, and potash.

[26]Members of the audience named the demonstrator with which they had contact; therefore, several demonstrators were named more than once. One member of the audience could not recall the names of demonstrators with whom he had had contact.

strator-audience relationships is regarded as a "pair" and is the unit of analysis. The results reported in this section of the present publication should be regarded as highly tentative in nature because of the relatively small number of pairs.

ADOPTER CATEGORY

The adopter category was determined for both the demonstrator and the farmer in each of the 43 paired relationships.[27] A tendency may be observed in Table 4 for audience members to seek information from a demonstrator in a slightly earlier adopting category. There were no extreme cases of a laggard audience member communicating

[27]The adopter categories were determined from an adoption-of-farm-practices scale. Those with highest scores are the earliest to adopt and are termed innovators. The last to adopt are laggards.

Photo 3.—Farmers Reached by the Demonstrations Were Generally More Progressive Farmers Than Those Not Reached.

Table 4.—Adopter Category Differences for Paired Demonstrator-Audience Relationships

Demonstrator	Audience Member				
	Innovators	Early Adopters	Early Majority	Late Majority	Laggards
Innovators	—	1	6	3	—
Early Adopters	—	**5**	11	2	—
Early Majority	—	4	**4**	4	2
Late Majority	—	—	—	—	—
Laggards	—	—	—	—	—

with an innovator or early adopter demonstrator. However, two laggard audience members communicated with two early majority demonstrators. These findings tend to indicate that members of the audience generally tended to communicate with demonstrators either in a similar or earlier adopting category, but seldom with a later adopting demonstrator.

SOCIAL STATUS

A measure of social status was determined for the audience and the demonstrators by an interviewer rating.[28] The ratings ranged from very low to very high. The social status of the audience member and demonstrator in each of the 43 demonstrator-audience relationships generally tended to be similar, but there was not a great deal of variation in the social status ratings. Where differences in status existed between a demonstrator-audience pair, there was a general tendency for farmers to communicate with demonstrators with a slightly higher social status than their own.

GEOGRAPHICAL DISTANCE

Audience farmers tended to communicate with demonstrators living near them. Miles between the audience farmers and the demonstrators they sought ranged from zero to 13 miles and averaged 4.02 miles for the 43 relationships. Farmers did not necessarily contact the demonstrator closest to them, but seldom did they travel more than eight miles to contact a demonstrator. Only a slight tendency could be observed for farmers to communicate with demonstrators who were located close to their travel patterns to trade centers.

[28]A description of the development of the social status rating may be found in Rogers and Capener, op. cit.

DISCUSSION

Several observations and recommendations for action may be drawn from the present investigation. Present findings are compared with research results from other studies in this section.

1. A demonstration program should not be evaluated only in terms of the number of persons attending formally conducted tours of demonstration plots. A farmer does not necessarily need to see a demonstration in order for its results to influence his behavior and attitudes. None of the farmers in the present audience sample reported attending a formally conducted tour (although several demonstration tours were conducted during the 1959 crop year). An Iowa study indicated only five percent of the respondents reported attending a tour in the past year.[29] Informal visiting between audience farmers and demonstrators is considerably more frequent than contact with demonstrations through formally conducted tours.

2. A demonstration program results in considerable attitude change among the demonstrators themselves. In the present study, for example, 23 percent of the demonstrators reported they intended to apply higher rates of fertilization, 22 percent intended to follow soil tests more closely, and 36 percent intended to plant corn at a thicker rate the following crop year as a result of their demonstration plot.

3. People generally tend to communicate and associate with others of similar attitudes, values, and characteristics.[30] High status farmers tended to communicate with high status demonstrators; early adopters often visited the plots of early adopter demonstrators. This tendency may be undesirable in a demonstration program because it prevents a more effective "trickle-down" of ideas and information through the two-step flow of communication. One obvious implication of the tendency for persons to associate with others like themselves is the need to secure demonstrators at each status level, educational level, etc. One difficulty with this procedure, however, is that lower status farmers are more likely to have difficulty in completing their demonstrations successfully. Lower status farmers are less likely to understand the scientific method basic to conducting a demonstration, to be personally convinced of the practice they are demonstrating, or to be willing to

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[29]Beal and Bohlen, op. cit., p. 26.

[30]This widely observed tendency for mutual attraction on the basis of shared values is termed "value homophily" by Katz and Lazarsfeld, op. cit., p. 59.

welcome tours and visitors to their farms because of run-down buildings. In the present study a compliance rating was determined for each demonstrator, which measured how well or poorly he carried out the demonstration according to uniform instructions.[31] Demonstrators who followed the instructions most closely were characterized by higher social status, but there were no significant relationships with education or earlier adoption of farm practices.[32]

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[31]This compliance rating was made by a panel of judges who were well acquainted with each of the 47 demonstrators and who based their decisions on such data as compliance with specifications on plot layout, planting rate, fertilizer rate, and harvesting precedures.

[32]Correlation of compliance ratings with social status is —.36, with education is +.03, and with adoption scores is —.09.